Respiratory Mucosa

Functions:
- Warms air
- Filters air
  - cilia
- Moistens incoming air
  - conchae
Larynx

Voice Box
- Epiglottis
  - "guardian of the airway"
  - movement
- Larynx
  - Vocal cords

Glottis Function

Gas Exchange

bronchiole
pulmonary artery
pulmonary vein
alveoli
Alveoli

Function:
- Gas exchange
- Simple diffusion

Anatomy:
- simple, squamous, epithelial cells
- capillary network

Respiration
Respiration

- Pulmonary ventilation (breathing)
  - Inspiration (inhale)
  - Expiration (exhale)
- External respiration
- Internal respiration
- Cellular respiration

**Inspiration**

- Rib cage moves up and out.
- Diaphragm contracts and moves down.
- Pressure in lungs decreases, and air comes rushing in.

**Expiration**

- Rib cage moves down and in.
- Diaphragm relaxes and moves up.
- Pressure in lungs increases, and air is pushed out.
Gas Transportation

- Oxygen - transported bound to hemoglobin (oxyhemoglobin) inside RBC's
- Carbon dioxide - transported as bicarbonate ion in plasma
  \[ \text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3 \rightarrow \text{H}^+ + \text{HCO}_3^- \]

External Respiration

Exchange of gases (oxygen and carbon dioxide) between the lungs and the blood.
**Internal Respiration**

Exchange of gases (oxygen and carbon dioxide) between the blood and the tissue
- capillaries

**Cellular Respiration**

- Occurs inside cells in the mitochondria
- Glucose is broken down
- Oxygen is used to make ATP
- Carbon dioxide is produced as a waste
Control of Respiration

- Nervous control - medulla and pons
- Physical factors - increased body temperature, exercise, speech
- Conscious control
- Emotional factors - fear, anger, excitement
- Chemical factors - carbon dioxide level

Respiratory Disorders

- Emphysema - permanent enlargement and destruction of alveoli
- Chronic bronchitis - excessive mucus production
  > chronic hypoxia
- Lung cancer - aggressive and metastasizes rapidly
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Bronchitis

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Lung Cancer

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The End